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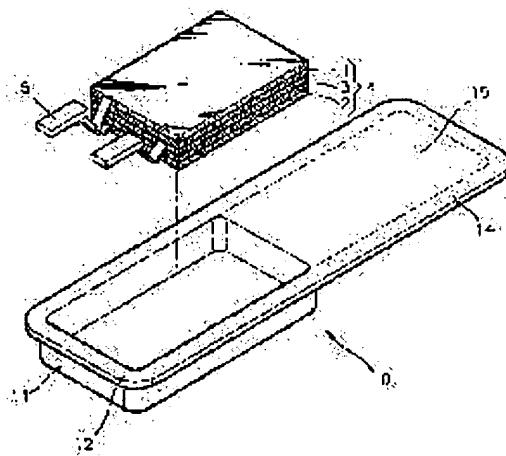
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(54) CASE FOR SECONDARY BATTERY, AND ITS MANUFACTURE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a case for a secondary battery, which allows mass production and improves rigidity of joint surface for closing the receiving portion of the case receiving the battery, and a manufacturing method for such case for the secondary battery.

SOLUTION: This case is provided with a receiving portion 11 having a receiving space for a battery body 4 and an inlet opened on its upper part, a first jointed portion 12 extending along an edge at the inlet of the receiving portion 11, a lid portion 15 that extends from one side of the receiving portion and closes the inlet of the receiving portion 11, when it is folded to the receiving portion 11, and a second jointed portion 14 that extends along the edge of the lid portion 15 and is connected with the first jointed portion 12, when it is folded to the receiving portion 11. Thus, a secondary battery which facilitates mass production and improves rigidity of joint surface is obtained.



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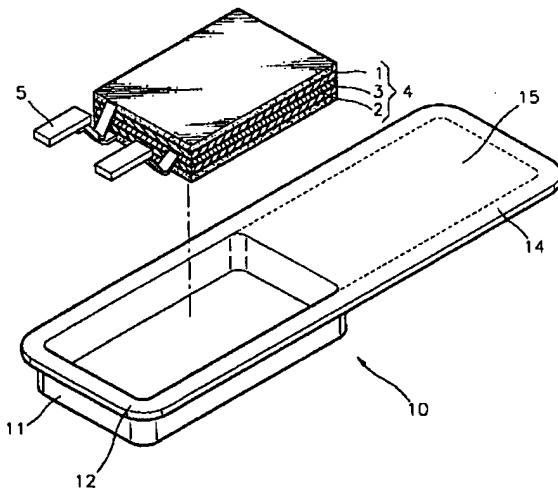
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(54)【発明の名称】 二次電池のケース及びその製造方法

(57)【要約】

【課題】 大量生産が可能であり、かつ電池が受け入れられたケースの受入部を閉鎖する接合面の堅固さが向上された二次電池のケースを提供するとともに、このような二次電池のケースの製造方法を提供する。

【解決手段】 電池本体4の受入空間とその上部に開放された入口を有した受入部11と、前記受入部11の入口で縁に沿って延びる第1接合部12と、前記受入部11の一側から延びて前記受入部11に対して折られる時前記受入部11の入口を閉鎖させる蓋部15と、前記受入部11に対して折られる時前記第1接合部12に対応して接合されて前記蓋部15の縁に沿って延びる第2接合部14とを備えて形成される。これにより、二次電池は大量生産が容易であり、接合面の堅固性が向上される。



【特許請求の範囲】

【請求項1】 電池本体の受入空間とその上部に開放された入口を有した受入部と、前記受入部の縁に沿って延びる第1接合部と、前記受入部の上部一側から延びて前記受入部に対して折られる時前記受入部の入口を閉鎖させる蓋部と、前記受入部に対して折られる時前記第1接合部に対応して接合され、前記蓋部の縁に沿って延びる第2接合部と、を備えて形成されたことを特徴とする二次電池のケース。

【請求項2】 前記受入部、前記第1接合部、前記蓋部及び前記第2接合部は一体に形成されることを特徴とする請求項1に記載の二次電池のケース。

【請求項3】 前記第1接合部と前記第2接合部は相接時に変形されない状態で接合されることを特徴とする請求項1に記載の二次電池のケース。

【請求項4】 前記第1接合部と前記第2接合部は相接時に相応するエンボシングが形成された状態で接合されることを特徴とする請求項1に記載の二次電池のケース。

【請求項5】 前記第1接合部と前記第2接合部は相接時に接合部の長手方向へ相応する凸部と凹部が形成された状態で接合されることを特徴とする請求項1に記載の二次電池のケース。

【請求項6】 電池本体の受入空間とその上部に開放された入口を有した受入部と、前記受入部の入口で縁に沿って延びる第1接合部と、前記受入部の入口を閉鎖するように前記受入部と分離形成された蓋部と、前記第1接合部に対応して接合され、前記蓋部の縁に沿って延びる第2接合部と、を備えて形成されたことを特徴とする二次電池のケース。

【請求項7】 前記第1接合部と前記第2接合部は相接時に変形されない状態で接合されることを特徴とする請求項6に記載の二次電池のケース。

【請求項8】 前記第1接合部と前記第2接合部は相接時に相応するエンボシングが形成された状態で接合されることを特徴とする請求項6に記載の二次電池のケース。

【請求項9】 前記第1接合部と第2接合部は相接時に接合部の長手方向へ相応する凸部と凹部が形成された状態で接合されることを特徴とする請求項6に記載の二次電池のケース。

【請求項10】 平板状のケース素材を準備する段階と、電池本体の受入部、前記電池本体の受入部の側面に位置するガス受入部、前記電池本体の受入部と前記ガス受入部とを連結する通路及び電池本体の受入部と前記ガス受

入部とを共に覆える蓋部を形成する複数の区画を前記ケース素材上に設定する段階と、前記ケース素材を成形加工することによって前記電池本体の受入部、前記ガス受入部及び前記通路を形成する段階と、前記各区画別に前記ケース素材を切断する段階と、を備えることを特徴とする二次電池ケースの製造方法。

【請求項11】 前記素材の成形加工はプレス加工により遂行されることを特徴とする請求項10に記載の二次電池ケースの製造方法。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は二次電池のケース及びその製造方法に係り、さらに詳細には電流を発生させる電池の本体をシーリングする二次電池のケース及びその製造方法に関する。

【0002】

【従来の技術】通常、リチウム二次電池は陽極板、陰極板及びセパレーターが積層されて電流を生成する電池本体を備える。そして、電池本体には外部との電気的な通路役割をする電極端子が連結され、電池本体と電極端子の一部はそれらに対して絶縁状態のケースにより密封される。

【0003】しかしながら、従来は、リチウム二次電池はハウチ形態のケースに電池本体を挿入した後製造されるが、その構造に起因して大量生産が容易でなく、かつ電池が受け入れられたケースの受入部を閉鎖する接合面が安定しないという問題点があった。

【0004】

30 【発明が解決しようとする課題】そこで、本発明は大量生産が可能であり、かつ電池が受け入れられたケースの受入部を閉鎖する接合面の堅固さが向上された二次電池のケースを提供することを目的とする。

【0005】また、本発明の他の目的は上記の如き二次電池のケースの製造方法を提供することにある。

【0006】

【課題を解決するための手段】前記のような目的を達成するために、本発明によると、電池本体の受入空間とその上部に開放された入口を有した受入部と、前記受入部の入口で縁に沿って延びる第1接合部と、前記受入部の上部一側から延びて前記受入部に対して折られる時前記受入部の入口を閉鎖する蓋部と、前記受入部に対して折られる時前記第1接合部に対応して接合され、前記蓋部の縁に沿って延びる第2接合部と、を備えて形成された二次電池のケースが提供される。

【0007】本発明の一特徴によると、前記受入部、前記第1接合部、前記蓋部及び前記第2接合部は一体に形成される。

【0008】本発明の他の特徴によると、前記第1接合部と前記第2接合部は相接時に変形されない平面状態で

接合される。

【0009】本発明の他の特徴によると、前記第1接合部と前記第2接合部は相接時に相応するエンボシングが形成された状態で接合される。

【0010】本発明の他の特徴によると、前記第1接合部と前記第2接合部は相接時に長手方向へ相応する凸部と凹部が形成された状態で接合される。

【0011】又、本発明によると、電池本体の受入空間とその上部に開放された入口を有した受入部と、前記受入部の入口で縁に沿って延びる第1接合部と、前記受入部の入口を閉鎖させる蓋部と、前記第1接合部に対応して接合され、前記蓋部の縁に沿って延びる第2接合部と、を備えて形成された二次電池のケースが提供される。

【0012】又、本発明によると、平板状のケース素材を準備する段階と、電池本体の受入部、前記電池本体の受入部の側面に位置するガス受入部、前記電池本体の受入部と前記ガス受入部とを連結する通路及び電池本体の受入部と前記ガス受入部とと共に覆える蓋部を形成する複数の区画を前記ケース素材上に設定する段階と、前記ケース素材を成形加工することによって前記電池本体の受入部、前記ガス受入部及び前記通路を形成する段階と、前記各区画別に前記ケース素材を切断する段階と、を備える二次電池ケースの製造方法が提供される。

【0013】本発明の一特徴によると、前記素材の成形加工はプレス加工により遂行される。

【0014】

【発明の実施の形態】以下、添付した図面を参照して本発明の望ましい実施の形態を詳細に説明する。

【0015】図1は本発明の一実施の形態による二次電池のケースに対する一例を示した概略的な分解斜視図である。

【0016】図面を参照すれば、二次電池は陽極板1、陰極板2及びセパレーター3が積層されて電流を発生させる電池本体4及び、前記電池本体4を密封するケース10を備える。

【0017】前記電池本体4は、例えば、リチウムイオン電池、リチウムポリマー電池、プラスチックリチウムイオン電池等リチウム二次電池の種類に応じてその構成が異なってできる。そして、電池本体4がケース10により密封される時外部との電気的な通路の役割をする電極端子5は一端が電池本体4の各極板に連結され、他端はケース10の外部へ露出される。

【0018】本実施の形態によると、前記ケース10は電池本体4が受け入れられる受入部11、前記受入部11の入口で縁に沿うフランジである第1接合部12、前記受入部11に対して折られることにより前記受入部11の入口を覆う蓋部15及び前記受入部11に対して折られる時前記第1接合部12と接合されて前記蓋部15の縁に沿って水平に延びる第2接合部14を備えて形成される。

【0019】前記受入部11は電池本体4を受け入れできる空間を有し、開放された上部の入口を除いた5個の面が閉鎖された状態である。蓋部15は受入部11の一側上に延びたフランジであり、蓋部が折られた時前記受入部11が閉鎖できる。

【0020】前記受入部11、第1接合部12、蓋部15及び第2接合部14は一体に形成される。電池本体4は受入部11の開放された上部入口を通じて受入部11内に受け入れられる。

【0021】図面に示されたように、蓋部15が折られなかった状態、即ち、蓋部15が受入部11を閉鎖しない状態では第1接合部12と第2接合部14が一つの四角形のフランジを形成する。蓋部15は受入部11内に電池本体4が受け入れられた後に受入部11の上部入口を閉鎖する。第1接合部12と第2接合部14は相接後に垂直方向に曲げられることもある。

【0022】図2は図1の二次電池が組み立てられた状態を示す平面図である。

【0023】図面を参照すれば、電池本体4が受入部11に挿入された後電池本体4の各極板(図示せず)と連結された電極端子5がケース10外へ所定長さ露出されており、蓋部15は受入部11を閉鎖している。図面にハッチングされた部位21は第1接合部12と第2接合部14が相接された部位を示す。ここで、蓋部15が受入部11から延びる部位では別途に接合部を形成する必要がないので、ケース10の全体大きさに対する電池本体4の占有比率が大きくなる。従って、このような二次電池は単位体積当たりの電池効率が向上される。

【0024】図3は本発明の他の実施の形態による二次電池のケースを概略的に示した分解斜視図である。

【0025】図面を参照すれば、二次電池は図1に示された二次電池のように、陽極板1、陰極板2及びセパレーター3が積層されて電流を発生させる電池本体4と、前記電池本体4を密封するケース30を備える。ここで、ケース30は、受入部31と前記受入部31の上面に形成された入口が閉鎖できるように分離されて製作された蓋部35を備える。

【0026】前記受入部31は電池本体4を受け入れできる空間を有し、開放された上部の入口を除いた5個の面が閉鎖された状態である。受入部31は第1接合部32としてフランジを備える。そして、前記蓋部35は電池本体4が挿入された後、受入部31の入口が閉鎖できる板状の形態である。第2接合部34は蓋部35のマージン領域である。第2接合部34は第1接合部32に対応して接合される。このような受入部31及び蓋部35の製作はケース用素材の板状材料に対して金型加工等の成形加工を通じて製作が可能である。

【0027】図4は図3の二次電池が組み立てられた状態を示す平面図である。

【0028】図面を参照すれば、電池本体4が受入部31

に挿入され、電池本体4の各極板(図示せず)と連結された電極端子5がケース30の外へ所定長さ露出された状態で蓋部35が受入部31を閉鎖する。図面でハッチングされた部位41は第1接合部32及び第2接合部34が相接された接合部位を示す。本実施形態では、第1接合部32と第2接合部34の接合力を向上させるために、受入部31と蓋部35の材質及び厚さを異ならせて製作できる。

【0029】前述したような二次電池のケースの製造方法は次の通りである。

【0030】先ず、金属板に成形加工を通じて受入部1,31と第1接合部12,32を形成し、蓋部15,35に第2接合部14,34を形成する。この際、蓋部15,35及び第2接合部14,34は受入部11,31及び第1接合部12に対して一体に形成されるか又は分離形成できる。そして、電池本体4を受入部11,31に挿入した後、電池本体4と連結された電極端子5が外部へ露出されるように配置する。そして、受入部11,31のフランジである第1接合部12,32と蓋部15,35のマージン部位である第2接合部14,34とを相接させることにより、ケース10,30内部に閉鎖空間を形成する。

【0031】なお、前述した電池の製造方法は概略的なものであり、実際には電池本体4の受入部の側面にガス受入部を形成し、電池本体4を充放電させる際発生するガスをガス受入部に貯蔵する過程が含まれる。以下、この手順を図5に基づき詳しく説明する。

【0032】図5に示したのは板状の素材から図1に示した二次電池のケースを多数形成する方法を概略的に示した斜視図である。

【0033】図面を参照すれば、板状の素材51は点線で表示された線に沿って区画され、各区画別に一つの単位ケース54が形成できる。各単位ケース54は電池本体4の受入部52とガス受入部55を有する。電池受入部52から発生するガスは通路56を通してガス受入部55に放出される。

【0034】電池ケースに電池本体4を受入れて電池を製造するに当って、電池本体4を電池受入部52に受入れ、引続き蓋部53を覆って電池本体4の受入部52とガス受入部55とを同時にシールする。この際、通路56は開放された状態を保つ。次いで、電池本体4に対する充電及び放電を繰返すと、電池本体4から発生したガスが電池受入部52から通路56を通してガス受入部55に流動する。ガス受入部55にガスが集まると通路56を閉塞する。最後に、ガス受入部55は切断作業により除去される。

【0035】図5に示されたような単位ケース54はプレス加工のような所定の加工を通して各区画毎に電池本体受入部52、ガス受入部55及び通路56が形成された後、点線に沿って素材を切断することによって単位ケース54が形成される。

【0036】他の例では、素材51の長手方向に延びた点線に沿って切断する前に別に製作された電池本体4を受

入部52に挿入し、素材51の幅方向に延びた点線に沿って切断する。次いで、貼り合せられた蓋部53を同時に折って蓋部53が受入部52を閉塞させた状態で接合がなされるようになる。引き続き、電池本体4を充放電させ、通路56を閉塞し、最後に素材51を長手方向に切断することによってガス受入部55を取除くと同時に各単位ケースを分離する。

【0037】又、他の例では点線で表示された部分を切断するのとは別途に、受入部52が形成された部分と蓋部53が形成された部分とが相互分離されるように切断することにより図3に示された電池ケースを製作できる。

【0038】図6及び図8は図4でVI-VI線及びVIII-VII線に沿って切断した断面図であり、図7は図2でVII-VII線に沿って切断した断面図である。これらは、各々第1接合部12,32と第2接合部14,34を接合させる方法を示す。

【0039】図6は面接合方式を示し、第1接合部12,32と第2接合部14,34を変形させずに相互平面の状態で接合させる。接合の方法は多様な方法が採用できるが、アーチ溶接が望ましい。

【0040】図7はエンボシング方式を示すが、第1接合部12,32と第2接合部14,34に各々相応するエンボシングを形成することにより接合力を向上させ得る。

【0041】又、図8はリニア方式を示すが、これは第1接合部12,32と第2接合部14,34の長手方向に凸部と凹部を形成して相応されるようになる。この方式では、接合力を向上させ得る。

【0042】

【発明の効果】本発明に係る二次電池は、電池本体が受入れられる受入部、前記受入部を閉鎖する蓋部及び、前記受入部と蓋部との縁に延びた接合部を備えるケースを成形等を通じて容易に製作でき、且つ接合部が面接合方式、エンボシング接合方式及びリニア接合方式のうち1つにより接合されることにより、大量生産が可能であり、接合面の堅固さが向上されるという長所がある。

【図面の簡単な説明】

【図1】本発明の一実施の形態によるケースを備えた二次電池の一例を示した概略的な分解斜視図である。

【図2】図1の二次電池を組み立てた状態を示す概略的な平面図である。

【図3】本発明の他の実施の形態によるケースを備えた二次電池の概略的な分解斜視図である。

【図4】図3の二次電池を組み立てた状態を示す概略的な平面図である。

【図5】図1に示された二次電池のケースを製造する方法を示す概略的な斜視図である。

【図6】図4のVI-VI線に沿って切断した状態を示す断面図である。

【図7】図2のVII-VII線に沿って切断した状態を示す断面図である。

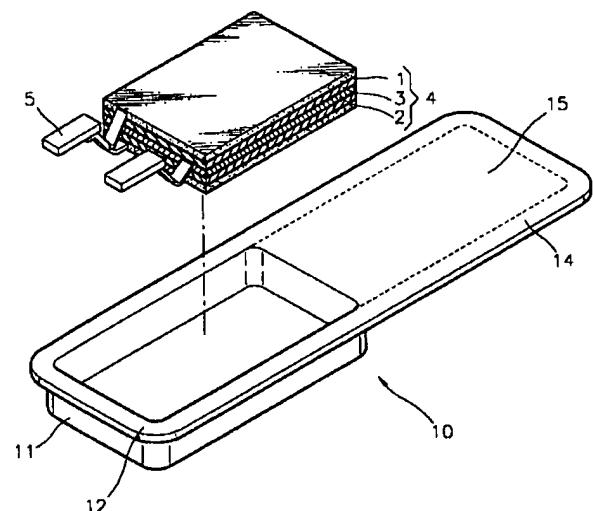
【図8】図4のVII-VIII線に沿って切断した状態を示す断面図である。

【符号の説明】

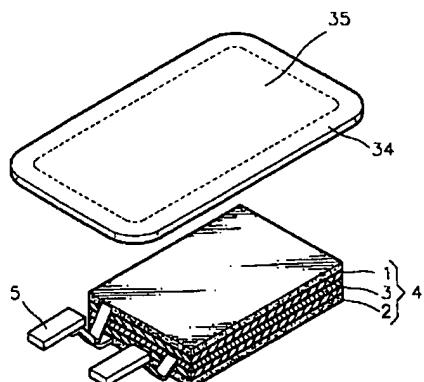
- 1 陽極板
- 2 陰極板
- 3 セパレーター
- 4 電池本体
- 5 電極端子

- * 10,30 ケース
- 11,31,52 受入部
- 12,32 第1接合部
- 14,34 第2接合部
- 15,35,53 蓋部
- 21,41 ハッチングされた部位
- 51 素材
- * 54 単位ケース

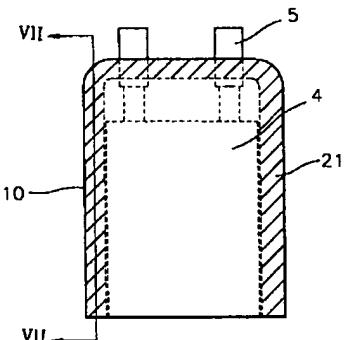
【図1】



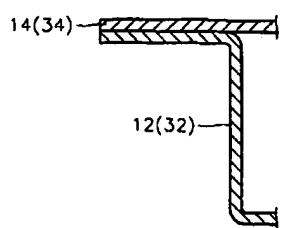
【図3】



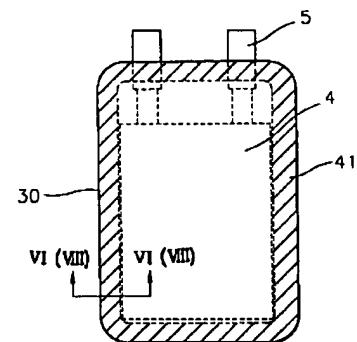
【図2】



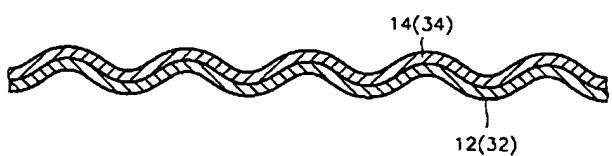
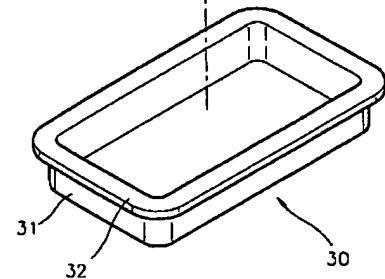
【図6】



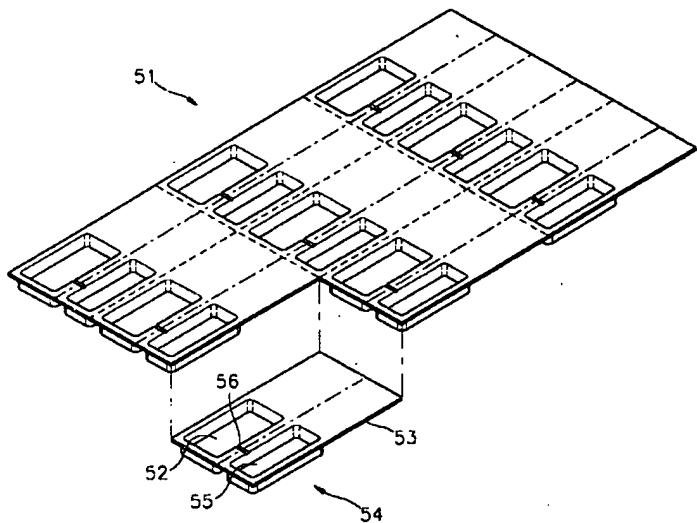
【図4】



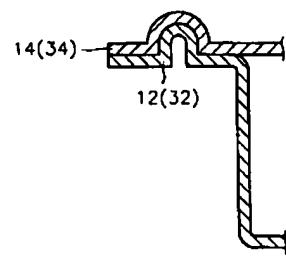
【図7】



【図5】



【図8】



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CLAIMS

[Claim(s)]

[Claim 1]Accepting space of a cell proper, and an accession department with an entrance opened wide in the upper part, The 1st joined part prolonged along an edge of said accession department, and a covering device which makes an entrance of said accession department close when it extends from the upper part 1 side of said accession department and is broken to said accession department, A case of a rechargeable battery which having had the 2nd joined part that is joined corresponding to said 1st joined part when broken to said accession department, and is prolonged along an edge of said covering device, and forming.

[Claim 2]A case of the rechargeable battery according to claim 1, wherein said accession department, said 1st joined part, said covering device, and said 2nd joined part are formed in one.

[Claim 3]A case of the rechargeable battery according to claim 1, wherein said 1st joined part and said 2nd joined part are joined in the state where it does not change at the time of ****.

[Claim 4]A case of the rechargeable battery according to claim 1 where embossing which ****s at the time of **** is formed said 1st joined part and said 2nd joined part, wherein it is joined.

[Claim 5]A case of the rechargeable battery according to claim 1 where heights and a crevice which **** to a longitudinal direction of a joined part at the time of **** are formed said 1st joined part and said 2nd joined part, wherein it is joined.

[Claim 6]Accepting space of a cell proper, and an accession department with an entrance opened wide in the upper part, A case of a rechargeable battery which having had the 1st joined part prolonged along an edge at an entrance of said accession department, a covering device by which separation formation was carried out with said accession department so that an entrance of said accession department might be made to close, and the 2nd joined part that is joined corresponding to said 1st joined part, and is prolonged along an edge of said covering device, and forming.

[Claim 7]A case of the rechargeable battery according to claim 6, wherein said 1st joined part and said 2nd joined part are joined in the state where it does not change at the time of ****.

[Claim 8]A case of the rechargeable battery according to claim 6 where embossing which ****s at the time of **** is formed said 1st joined part and said 2nd joined part, wherein it is joined.

[Claim 9]A case of the rechargeable battery according to claim 6 where heights and a crevice which **** to a longitudinal direction of a joined part at the time of **** are formed said 1st joined part and the 2nd joined part, wherein it is joined.

[Claim 10]A manufacturing method of a secondary battery case characterized by comprising the following.

A stage of preparing a plate-like case raw material.

A stage of setting up two or more divisions which form a covering device which can cover both a passage which connects a gas accession department located in the side of an accession department of a cell proper, and an accession department of said cell proper, and an accession department and said gas accession department of said cell proper, and an accession department and said gas accession department of a cell proper on said case raw material.

A stage which forms an accession department, said gas accession department, and said passage of said cell proper by carrying out the fabricating operation of said case raw material.

A stage of cutting said case raw material according to said each division.

[Claim 11]A manufacturing method of the secondary battery case according to claim 10, wherein a fabricating operation of said raw material is carried out by press working of sheet metal.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention]This invention relates to a case of the rechargeable battery which carries out the ceiling of the main part of the cell which is built over a case of a rechargeable battery, and a manufacturing method for the same, and more particularly is made to generate current, and a manufacturing method for the same.

[0002]

[Description of the Prior Art]Usually, a lithium secondary battery is provided with the cell proper which a positive plate, a cathode plate, and a separator are laminated, and generates current. And the electrode terminal which carries out an electric passage role with the exterior is connected with a cell proper, and some of cells proper and electrode terminals are sealed in the case of an insulating state to them.

[0003]However, conventionally, after the lithium secondary battery inserted the cell proper in the case of a pouch gestalt, it was manufactured, but it originated in the structure and there was a problem that mass production was not easy and the plane of composition which closes the accession department of the case where the cell was received was not stabilized.

[0004]

[Problem(s) to be Solved by the Invention]Then, it aims at providing the case of the rechargeable battery whose solidity of the plane of composition which closes the accession department of the case where could mass-produce this invention and the cell was received improved.

[0005]Other purposes of this invention are to provide the manufacturing method of the case of the rechargeable battery like the above. [0006]

[Means for Solving the Problem]An accession department with an entrance which was wide opened in accepting space and the upper part of a cell proper according to this invention in

order to attain the above purposes, The 1st joined part prolonged along an edge at an entrance of said accession department, and a covering device which makes an entrance of said accession department close when it extends from the upper part 1 side of said accession department and is broken to said accession department, When broken to said accession department, it is joined corresponding to said 1st joined part, and a case of a rechargeable battery which was provided with the 2nd joined part prolonged along an edge of said covering device, and was formed is provided.

[0007]According to one feature of this invention, said accession department, said 1st joined part, said covering device, and said 2nd joined part are formed in one.

[0008]According to other features of this invention, said 1st joined part and said 2nd joined part are joined by a planar state which does not change at the time of ****.

[0009]According to other features of this invention, said 1st joined part and said 2nd joined part are joined where embossing which ****s at the time of **** is formed.

[0010]According to other features of this invention, said 1st joined part and said 2nd joined part are joined where heights and a crevice which **** to a longitudinal direction at the time of **** are formed.

[0011]An accession department with an entrance which was opened wide in accepting space and the upper part of a cell proper according to this invention, A case of a rechargeable battery which was provided with the 1st joined part prolonged along an edge at an entrance of said accession department, a covering device which makes an entrance of said accession department close, and the 2nd joined part that is joined corresponding to said 1st joined part, and is prolonged along an edge of said covering device, and was formed is provided.

[0012]A stage of preparing a plate-like case raw material according to this invention and an accession department of a cell proper, A stage of setting up two or more divisions which form a covering device which can cover both a passage which connects a gas accession department located in the side of an accession department of said cell proper, and an accession department and said gas accession department of said cell proper, and an accession department and said gas accession department of a cell proper on said case raw material, A manufacturing method of a secondary battery case provided with a stage which forms an accession department, said gas accession department, and said passage of said cell proper, and a stage of cutting said case raw material according to said each division is provided by carrying out the fabricating operation of said case raw material.

[0013]According to one feature of this invention, a fabricating operation of said raw material is carried out by press working of sheet metal.

[0014]

[Embodiment of the Invention]Hereafter, with reference to the attached drawing, the desirable embodiment of this invention is described in detail.

[0015] Drawing 1 is a rough exploded perspective view showing an example to the case of the rechargeable battery by the 1 embodiment of this invention.

[0016] A rechargeable battery will be provided with the case 10 which seals the cell proper 4 which the positive plate 1, the cathode plate 2, and the separator 3 are laminated, and is made to generate current, and said cell proper 4 if drawings are referred to. [0017] Said cell proper 4 can differ and perform the composition according to the kind of lithium secondary batteries, such as a lithium ion battery, a lithium-polymer battery, and a plastic lithium ion battery, for example. And when the cell proper 4 is sealed in the case 10, one end is connected with each polar plate of the cell proper 4, and, as for the other end, the electrode terminal 5 which carries out the role of an electric passage with the exterior is exposed to the exterior of the case 10.

[0018] According to this embodiment. Said case 10 by being broken to the accession department 11 in which the cell proper 4 is received, the 1st joined part 12 that is the flanges which meet an edge at the entrance of said accession department 11, and said accession department 11. When folding the entrance of said accession department 11 to the wrap covering device 15 and said accession department 11, it has the 2nd joined part 14 that is joined to said 1st joined part 12, and is horizontally prolonged along the edge of said covering device 15, and is formed. [0019] Said accession department 11 is in the state where have the space in which the cell proper 4 is acceptable, and five fields except the entrance of the upper part opened wide were closed. The covering device 15 is the flange prolonged on the 1 the accession department 11 side, and when a covering device is folded, it can close said accession department 11.

[0020] Said accession department 11, the 1st joined part 12, the covering device 15, and the 2nd joined part 14 are formed in one. The cell proper 4 is received in the accession department 11 through the upper part entrance where the accession department 11 was opened wide.

[0021] As shown in the drawing, the 1st joined part 12 and the 2nd joined part 14 form the flange of one quadrangle in the state, i.e., the state where the covering device 15 does not close the accession department 11, where the covering device 15 was not folded. The covering device 15 closes the upper part entrance of the accession department 11, after the cell proper 4 is received in the accession department 11. The 1st joined part 12 and the 2nd joined part 14 may be perpendicularly bent after ****.

[0022] Drawing 2 is a top view showing the state where the rechargeable battery of drawing 1 was assembled.

[0023] If drawings are referred to, predetermined length exposure of the electrode terminal 5 connected with each polar plate (not shown) of the back cell proper 4 in which the cell proper 4 was inserted in the accession department 11 will be carried out out of the case 10, and the covering device 15 will have closed the accession department 11. The part 21 by which hatching was carried out to the drawing shows the part where the 1st joined part 12 and the

2nd joined part 14 met. Here, since the covering device 15 does not need to form a joined part separately by the part which extends from the accession department 11, the occupation ratio of the cell proper 4 to the whole case 10 size becomes large. Therefore, the battery efficiency of a rechargeable battery [such] per unit volume improves.

[0024]Drawing 3 is an exploded perspective view showing roughly the case of the rechargeable battery by other embodiments of this invention.

[0025]A rechargeable battery will be provided with the cell proper 4 which the positive plate 1, the cathode plate 2, and the separator 3 are laminated, and is made to generate current like the rechargeable battery shown in drawing 1, and the case 30 which seals said cell proper 4 if drawings are referred to. Here, the case 30 is provided with the covering device 35 separated and manufactured so that the entrance formed in the upper surface of the accession department 31 and said accession department 31 could be closed.

[0026]Said accession department 31 is in the state where have the space in which the cell proper 4 is acceptable, and five fields except the entrance of the upper part opened wide were closed. The accession department 31 is provided with a flange as the 1st joined part 32. And said covering device 35 is a tabular gestalt which can close the entrance of the accession department 31, after the cell proper 4 is inserted. The 2nd joined part 34 is a margin region of the covering device 35. The 2nd joined part 34 is joined corresponding to the 1st joined part 32. Manufacture of such an accession department 31 and the covering device 35 can be manufactured through fabricating operations, such as metallic mold processing, to the charge of a tabular material of the raw material for cases.

[0027]Drawing 4 is a top view showing the state where the rechargeable battery of drawing 3 was assembled.

[0028]If drawings are referred to, the cell proper 4 will be inserted in the accession department 31, and where predetermined length exposure of the electrode terminal 5 connected with each polar plate (not shown) of the cell proper 4 is carried out out of the case 30, the covering device 35 will close the accession department 31. The part 41 by which hatching was carried out with the drawing shows the joined part where the 1st joined part 32 and the 2nd joined part 34 met. According to this embodiment, in order to raise the junction power of the 1st joined part 32 and the 2nd joined part 34, the construction material and thickness of the accession department 31 and the covering device 35 are changed, and it can manufacture.

[0029]The manufacturing method of the case of a rechargeable battery which was mentioned above is as follows.

[0030]First, the accession departments 11 and 31 and the 1st joined part 12 and 32 are formed in a metal plate through a fabricating operation, and the 2nd joined part 14 and 34 is formed in the covering devices 15 and 35. or [under the present circumstances, / that the covering devices 15 and 35 and the 2nd joined part 14 and 34 are formed in one to the accession

departments 11 and 31 and the 1st joined part 12] -- or separation formation can be carried out. And after inserting the cell proper 4 in the accession departments 11 and 31, it arranges so that the electrode terminal 5 connected with the cell proper 4 may be exposed to the exterior. And closed space is formed in the case 10 and 30 insides by making the 1st joined part 12 and 32 that is the flanges of the accession departments 11 and 31, and the 2nd joined part 14 and 34 that is the margin parts of the covering devices 15 and 35 meet.

[0031]The manufacturing method of the cell mentioned above is rough, a gas accession department is actually formed in the side of the accession department of the cell proper 4, and the process in which the gas emitted when carrying out the charge and discharge of the cell proper 4 is stored in a gas accession department is included. Hereafter, this procedure is explained in detail based on drawing 5.

[0032]What was shown in drawing 5 is a perspective view showing roughly how to form many cases of the rechargeable battery shown in drawing 1 from the tabular raw material.

[0033]If drawings are referred to, the tabular raw material 51 is divided along the line displayed by the dotted line, and can form the one unit case 54 according to each division. Each unit case 54 has the accession department 52 and the gas accession department 55 of the cell proper 4. The gas emitted from the cell accession department 52 is emitted to the gas accession department 55 through the passage 56.

[0034]In receiving the cell proper 4 in a cell case, and manufacturing a cell, the cell proper 4 is received in the cell accession department 52, the covering device 53 is covered succeedingly, and the seal of the accession department 52 and the gas accession department 55 of the cell proper 4 is carried out simultaneously. Under the present circumstances, the passage 56 maintains the state where it was opened wide. Subsequently, if the charge and discharge to the cell proper 4 are repeated, the gas emitted from the cell proper 4 will flow from the cell accession department 52 to the gas accession department 55 through the passage 56. The passage 56 is blockaded if gas gathers for the gas accession department 55. Finally, the gas accession department 55 is removed by cutting.

[0035]After the cell-proper accession department 52, the gas accession department 55, and the passage 56 are formed for every division through predetermined processing [like press working of sheet metal] whose unit case 54 as shown in drawing 5 is, the unit case 54 is formed by cutting a raw material along a dotted line.

[0036]In other examples, before cutting along the dotted line prolonged in the longitudinal direction of the raw material 51, the cell proper 4 manufactured independently is inserted in the accession department 52, and it cuts along the dotted line prolonged crosswise [of the raw material 51]. Subsequently, junction is made in the state where the stuck covering device 53 was folded simultaneously and the covering device 53 made the accession department 52 blockade. Then, the charge and discharge of the cell proper 4 are carried out, the passage 56

is blockaded, and each unit case is separated at the same time it removes the gas accession department 55 by finally cutting the raw material 51 to a longitudinal direction.

[0037]The cell case shown to drawing 3 that it cuts the portion displayed by the dotted line in other examples by cutting so that mutual separation of the portion in which the accession department 52 was formed, and the portion in which the covering device 53 was formed may be carried out separately can be manufactured.

[0038]Drawing 6 and drawing 8 are the sectional views cut along the VI-VI line and the VIII-VIII line by drawing 4, and drawing 7 is the sectional view cut along the VII-VII line by drawing 2. These show the method of joining the 1st joined part 12 and 32 and the 2nd joined part 14 and 34 respectively.

[0039]Drawing 6 shows an interview accompaniment type and is made to join it in the state of a mutual flat surface, without changing the 1st joined part 12 and 32 and the 2nd joined part 14 and 34. Arc welding is desirable although the method of junction can adopt various methods.

[0040]Although drawing 7 shows an embossing method, it may raise junction power by forming the embossing which ****'s in the 1st joined part 12 and 32 and the 2nd joined part 14 and 34 respectively. [0041]Although drawing 8 shows a linear method, this forms heights and a crevice in the longitudinal direction of the 1st joined part 12 and 32 and the 2nd joined part 14 and 34, and it is made to **** in it. Junction power may be raised in this method.

[0042]

[Effect of the Invention]the covering device in which the rechargeable battery concerning this invention closes the accession department in which a cell proper is received, and said accession department -- and, When a case provided with the joined part prolonged on the edge of said accession department and a covering device can be easily manufactured through shaping etc. and a joined part is joined by one of a field junction method, an embossing junction method, and linear junction methods, it can mass-produce and there is the strong point in which the solidity of a plane of composition improves.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a rough exploded perspective view showing an example of the rechargeable battery provided with the case by the 1 embodiment of this invention.

[Drawing 2]It is a rough top view showing the state where the rechargeable battery of drawing 1 was assembled.

[Drawing 3]It is a rough exploded perspective view of the rechargeable battery provided with the case by other embodiments of this invention.

[Drawing 4]It is a rough top view showing the state where the rechargeable battery of drawing 3 was assembled.

[Drawing 5]It is a rough perspective view showing how to manufacture the case of the rechargeable battery shown in drawing 1.

[Drawing 6]It is a sectional view showing the state where it cut along the VI-VI line of drawing 4.

[Drawing 7]It is a sectional view showing the state where it cut along the VII-VII line of drawing 2.

[Drawing 8]It is a sectional view showing the state where it cut along the VIII-VIII line of drawing 4.

[Description of Notations]

- 1 Positive plate
- 2 Cathode plate
- 3 Separator
- 4 Cell proper
- 5 Electrode terminal
- 10 and 30 Case
- 11, 31, and 52 Accession department

- 12 and 32 The 1st joined part
- 14 and 34 The 2nd joined part
- 15, 35, and 53 Covering device
- 21 and 41 Part by which hatching was carried out
- 51 Raw material
- 54 Unit case

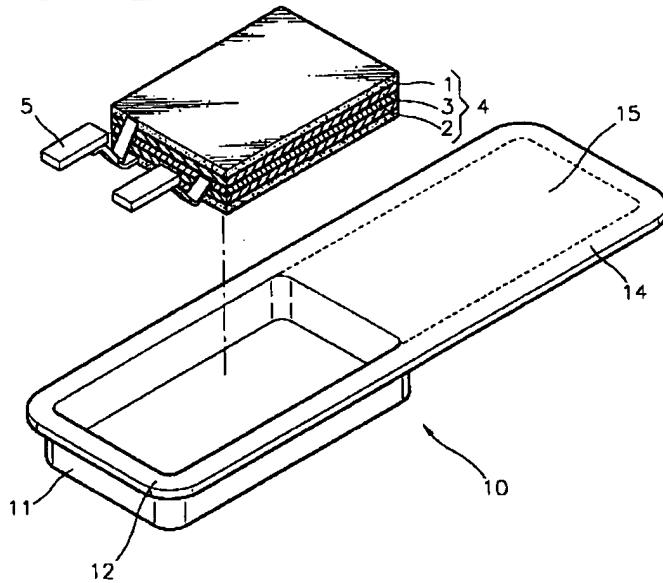
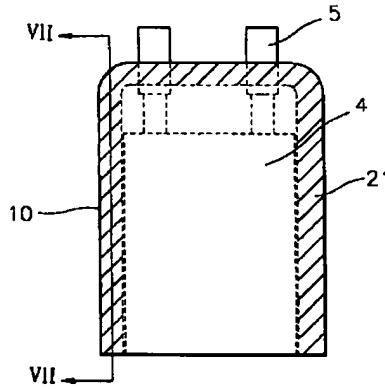
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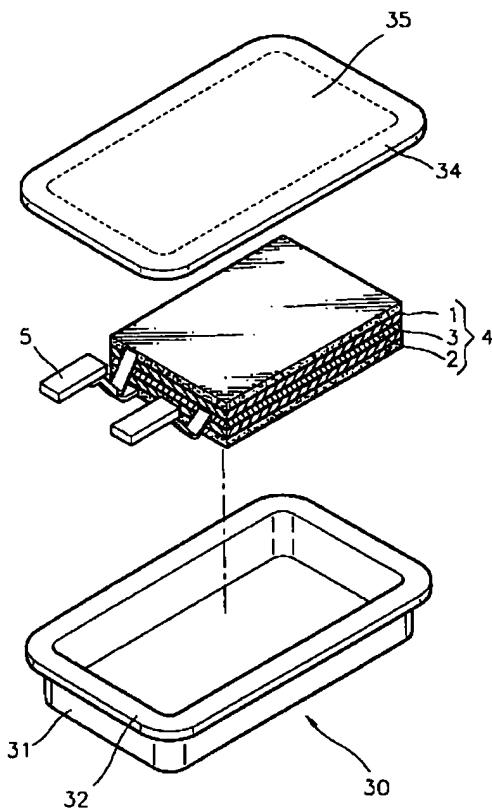
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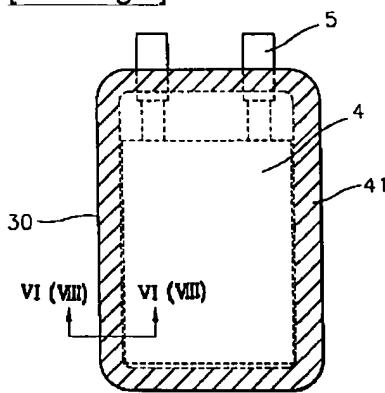
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DRAWINGS

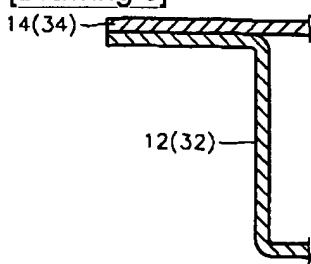
[Drawing 1]**[Drawing 2]****[Drawing 3]**



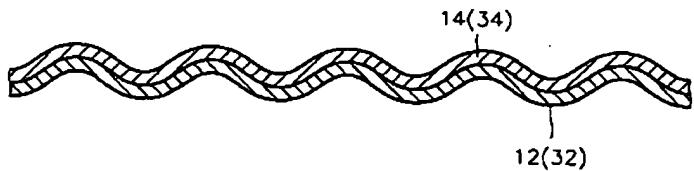
[Drawing 4]



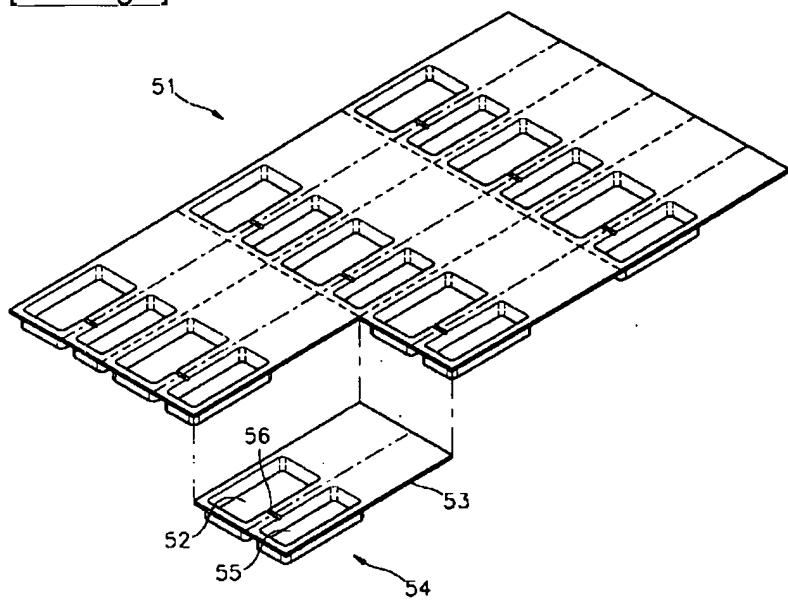
[Drawing 6]



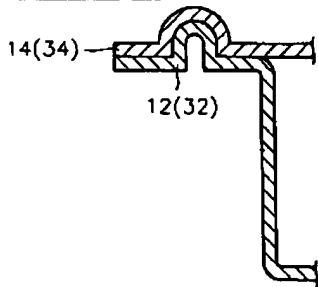
[Drawing 7]



[Drawing 5]



[Drawing 8]



[Translation done.]